

CLAIMS

1. A heat sink board formed by bonding, to a first heat sink, a second heat sink having a smaller linear expansion coefficient than that of the first heat sink,

wherein the second heat sink is fitted to the first heat sink, and a material of the first heat sink in the vicinity of a boundary between the fitted heat sinks is plastically deformed for bonding to the second heat sink.

2. The heat sink board heat sink according to Claim 1, wherein the second heat sink is a chip member for mounting a semiconductor component.

3. The heat sink board according to Claim 1 or 2, wherein the first heat sink has a plastic-bonding pressed groove, which is formed in a bonded surface thereof at the boundary between the fitted heat sinks and which receives a material of the second heat sink plastically deformed.

4. The heat sink board according to any one of Claims 1 to 3, wherein the first heat sink is made of a Cu-based material, and the second heat sink is made of a Cu-Mo composite material.

5. The heat sink board according to any one of Claims 1 to 4, wherein the first heat sink is flush with an electronic-component mounted surface of the second heat sink, and an entire peripheral edge of the second heat sink is exposed with formation of a pressing mark recessed by the plastic flow bonding.

6. The heat sink board according to Claim 5, wherein the

semiconductor component is fixed to the second heat sink by soldering.

7. The heat sink board according to any one of Claims 1, 2 and 3, wherein the first heat sink and the second heat sink are bonded to each other by the plastic flow bonding with a thermally conductive paste or wax 20 interposed between an inner peripheral surface of the first heat sink and an outer peripheral surface of the second heat sink.

8. The heat sink board according to any one of Claims 1, 2 and 3, wherein the first heat sink and the second heat sink are bonded to each other by the plastic flow bonding with a thermally conductive paste or wax 20 interposed between a lower surface of the first heat sink and a bottom surface of the second heat sink.

9. A method of manufacturing a heat sink board formed by bonding, to a first heat sink, a second heat sink having a smaller linear expansion coefficient than that of the first heat sink, the method comprising the steps of:

fitting the second heat sink into a fitting hole formed in the first heat sink, and locally plastically deforming a material in a peripheral portion of the first heat sink in contact with the second heat sink by a bonding punch which is descended along an outer peripheral wall of the second heat sink, thereby integrating the two heat sinks with each other by plastic flow bonding.

10. A power module device mounted to a heat sink board for a semiconductor device, which is formed by bonding, to a first heat sink, a second heat sink having a smaller linear

expansion coefficient than that of the first heat sink,
wherein the second heat sink is fitted to the first
heat sink, and a material of the first heat sink at a
boundary between the fitted heat sinks is plastically
deformed for close adhesion to the second heat sink.